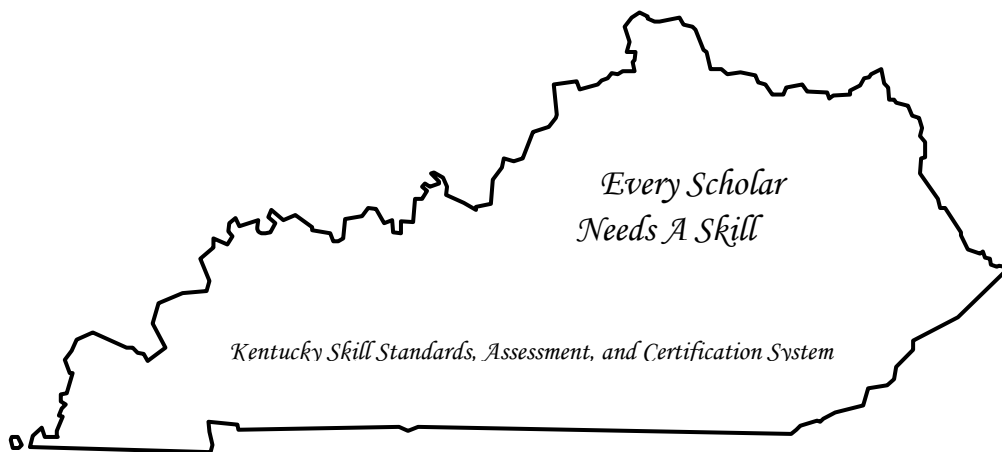


Kentucky Basic Manufacturing Skill Standards



Established by the Manufacturing Skill Standards Task Force

July 2000

ACKNOWLEDGMENTS

The mission of the Manufacturing Skill Standards Task Force was to develop a “user-friendly” document that would serve as a tool for instruction for all industrial technology education teachers. Our hope is that schools/teachers will use this document as a framework for further curriculum development. Future plans for the Task Force will include regular reviews and updates to the document as other career major areas are implemented.

A project of this significance relies heavily on the support and cooperation of many. The state effort could not have been accomplished without the persistence and guidance from Pamela Moore, State Skill Standards Project Director, and Mikala Rahn, national consultant for the effort. On behalf of the Kentucky Department of Education, Division of Career and Technical Education, I would like to acknowledge the support of the Manufacturing Skill Standards Task Force and the contribution they made to this project. The following persons served on this task force:

Ken Carroll, Executive Director, Bluegrass State Skill
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Emil Jezik, Department for Technical Education
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Keith Bird, Chancellor, Kentucky Community and Technical College System
Vince Senior, Associated Industries of Kentucky

The following business and industry representatives assisted with the development and/or review of the project and have endorsed the attached standards:

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INTRODUCTION

Manufacturing Career Cluster Core

In 1990, the Kentucky Education Reform Act (KERA) academic goals outlined what every student in Kentucky schools should know and be able to do. In 1999, Kentucky began the Kentucky Manufacturing Skill Standards that answers the question: “What does a worker need to know and be able to do to contribute to the safe and effective delivery of manufacturing occupations and related occupations?” The standards inform current and future manufacturing employers; employees and educators about what skills and knowledge workers need in order to succeed—in a job, a life-long career and as in the role of wage earner.

The need for development of skill standards originated at a summit called by the National Governors Association, the Education Commission of the States and the president of IBM Corporation. The focus of this summit looked at how standards for education and technology could be developed across the country to increase student achievement. As a result, Governor Paul Patton directed the Workforce Development Cabinet and the Department of Education to work on three objectives:

- Give more value to student work in high schools
- Utilize standards to reflect high expectations
- Apply performance (skill) standards to occupations

These entities partnered with the Cabinet for Economic Development and the Kentucky Community and Technical College System to facilitate the development of skill standards in Kentucky. The Cabinet for Economic Development and the Kentucky Industrial Development Council jointly funded the Target Industry Analysis that was utilized to identify primary and secondary industries within the Commonwealth. As a result of the analysis, manufacturing was identified as the priority industry sector and became the basis for the establishment of a “Manufacturing Skill Standards Task Force,” comprised solely of employers. Since employers are experts at knowing what skills are needed, it was determined that employers would define manufacturing skill standards through the Kentucky Manufacturing Skill Standards Task Force. The public sector facilitators were asked to identify assessment instruments and curricula to support and implement manufacturing skill standards. The private and public sector facilitators are jointly participating in and validating the process, with the private sector making any final determinations.

The Manufacturing Skill Standards Task Force utilized the skill standards developed by NACFAM (National Coalition for Advanced Manufacturing) as a template. These standards are divided into three categories: Academic, Employability and Occupational Skills. The standards are identified at two levels:

- Basic Level 1 – Applicable to all manufacturing organizations
- Advanced Level II – Applicable to high performance manufacturing organizations

The Kentucky Manufacturing Skill Standards Task Force has adopted skill standards at both Level I & II, completing Phase I of the project. The Kentucky Manufacturing Skill Standards Consortium (KMSSC) has been formed to continue the work of the Task Force. The KMSSC is a statewide consortium comprised solely of employer representatives from local and regional manufacturing consortia from throughout Kentucky. The mission of the KMSSC is to ensure that manufacturing skill standards, the assessment and the curriculum continue to facilitate the development of a highly skilled manufacturing workforce. Associated Industries of Kentucky (AIK) played a key role in the formation of the KMSSC and is working hard to make this initiative a great success. The Bluegrass State Skills Corporation has approved a grant for the KMSSC to fund 5-% of the total cost of \$199,700.00 for development of the assessment instruments

through Phase II. The Kentucky Community and Technical College System have also provided significant financial support toward the implementation of Phase II. VTECS is under contract as the assessment developer. They began their work in August of 1999 and are on schedule to meet their contractual obligations by August 31, 2000. Basic and advanced level assessment instruments have been developed and the first round of pilot testing was conducted in January and February 2000 at several sites throughout Kentucky. The second round of testing secondary, postsecondary and adult test takers occurred in April, May and June. Final validation of Phase II is targeted for completion in July after VTECS scores the assessments and develops reports to be presented to the KMSS Technical Committee.

Phase III is underway and involves the initial integration of manufacturing skill standards into existing curricula, within secondary and postsecondary systems, and the development of customized curriculum to address the needs of individual companies and training consortia. The Department of Technical Education of the Cabinet for Workforce Development and the Kentucky Department of Education are collaborating together to integrate the standards into existing secondary curricula. The Kentucky Community and Technical College System (KCTCS) are working to integrate the standards into existing postsecondary curricula. KCTCS is also taking the lead to establish an on demand assessment system and develop customized curriculum to implement the provision of remediation services. Once Phase I and II are validated by the KMSS Consortium, the standards as well as the assessment and remediation services will be rolled out statewide. This initiative is to be completed by August 31, 2000.

The key measures to the success of the voluntary manufacturing standards include the number of individuals certified; the number of individuals placed in jobs; cost reductions to employers; creation of new and retention of existing manufacturing jobs, and customer satisfaction.

Preparation for Tomorrow's Workforce

Carl D. Perkins Vocational and Technology Act of 1990 mandates broad vocational, rather than job-specific, training and an integration of academic and vocational content. The Act requires programs to provide students with a general understanding of "all aspects of an industry." More recently, the first of the five Indicators of Performance in the new Perkins legislation addresses "student attainment of challenging state-established academic and vocational/technical skill proficiencies."

Skill Standards are the performance specifications that identify the knowledge, skills and abilities, and individual needs to succeed in the workplace. Identifying the necessary skills is critical to preparing students for entry into employment. Skill standards provide a common vocabulary to enhance communication between:

- Employers and Job Seekers—to specify the knowledge, skills, aptitudes and attitudes required for recruitment, hiring, and retention in a company or within an industry.
- Employers and Schools or Job Training programs—to encourage the alignment of school curricula with industry requirements, to update educational objectives as workplace demands change, and to ensure a better return on public and private education and training investments.
- Employers or Job Seekers and Schools or Job Training Programs—to help employees and job seekers make decisions about their own education and training needs in a changing market place.

In the most successful workplaces, the only constant is change. Jobs that were previously simple now require high performance work processes and enhanced skills in order to compete globally. Skill standards reflect these changing workplace realities and are keys for helping

applicants and employers enjoy greater career opportunities and achieve higher standards of living and economic security.

Kentucky's Certification System

Skill standards are important today to educators, employers, and students who desire jobs after graduation from high school. The Division of Career and Technical Education, in conjunction with employers from the transportation industry, are working together to develop a system to certify that students have attained the necessary skills for employment. The first step in developing this system was the development or adoption of skill standards that describe the necessary occupational, academic and employability skills needed to enter the industry. Mastery of these standards would signal to employers that the student is employable and ready to begin employment with the industry.

In order to insure that students in fact attained the necessary skills described in the standards document, students will take an assessment based on the standards. The assessment system includes two components:

- Multiple-choice questions specifically testing the mastery of the Skill Standards; and

- Problem-based scenario to test the students problem solving and decision-Making skills related to their occupational standards.

Students that pass each of the components at a percentage previously set, will receive an industry recognized certificate to provide to employers communicating their mastery of the standards.

Program Sequence for Industrial Technology Education Manufacturing Skill Standards

Students should complete courses from the secondary Industrial Technology Education Manufacturing Cluster curriculum. In order to be successful on the Skill Standards assessment, students should complete a minimum of three credits from the following courses from the Kentucky Program of Studies or comparable courses from the Kentucky Tech Curriculum: Industrial Electronics Technology, Machine Tool Technology, Air Conditioning Technology, Industrial Systems Maintenance, Industrial Automation Technology, Welding, Wood Products Manufacturing, Major Appliance Technology, Industrial Chemical Processes, and Plastics Technology.

The Kentucky Manufacturing Core Skill Standards can be used as a framework for linking academic curricula to actual teaching practices, school to work, secondary education to post-secondary education, and students to their community. These connections will strengthen the manufacturing industry.

SkillsUSA VICA incorporates academic, employability, and occupational skill standards into the competitive events program at the regional, state and national levels.

The Skill Standards Document describes the skill standards to be assessed in the certification process. Current curriculum in Industrial Technology Education offered in your school should be aligned to these standards. A crosswalk shows the relationship between the manufacturing core skill standards, Kentucky academic expectations, and the Secretary's Commission on Achieving Necessary Skills (SCANS). SCANS was developed by the U.S. Department of Labor in 1991 with the involvement of employers from all across the nation. They describe the necessary foundation skills and competencies necessary to succeed in the workplace. The Kentucky Workforce Roundtable and other organizations have adopted the employability skills to communicate the needs of industry to schools.

For more information about the skill standards, crosswalks or certification system for Industrial Technology Education, please contact:

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	ACADEMIC
A1.1	Read process information and follow instructions.
A1.2	Read material and describe concepts
A1.3	Use correct pronunciation
A1.4	Use correct spelling
A1.5	Write with accuracy, brevity, and clarity
A1.6	Keyboarding
A1.7	Knowledge of conflict and resolution techniques
A1.8	Possess basic computer keyboarding skills
A1.9	Understanding basics of interpersonal communication (listening, written/oral, etc.)
	EMPLOYABILITY
E1.1	Read documentation, such as computer manual, to determine actions for specific situations
E1.2	Organize materials with logical flow
E1.3	Interpret and clarify directions prepared by others
E1.4	Communicate with customer to establish requirements
E1.5	Understanding team concepts
E1.6	Write steps of an occupational process using sentences and statements as appropriate
	MATH AND MEASUREMENT
	ACADEMIC
A2.1	Add, subtract, multiply, and divide four digit numbers with the use of a calculator
A2.2	Add, subtract, multiply, and divide four digit numbers without the use of a calculator
A2.3	Apply basic math functions to solve problems
A2.4	Convert between US and metric measurement systems
A2.5	Convert fractional measurement to decimal measurement
A2.6	Compute within measurement systems
A2.7	Document results of measurement activities and calculations
A2.8	Distinguish between US and metric measuring systems
A2.9	Calculate with percents, rate, ratio, and proportion with the use of a calculator
A2.10	Make reasonable estimates of arithmetic results without the use of a calculator
A2.11	Use hand calculators
	OCCUPATIONAL
O2.1	Create and interpret basic graphs and charts commonly used in manufacturing
O2.2	Match measurement activities to manufacturing processes
O2.3	Select and use appropriate measurement techniques and instruments
O2.4	Demonstrate proper general measurement techniques
	WORKPLACE SAFETY & HEALTH
	EMPLOYABILITY
E3.1	Assume responsibility for the personal safety of self and others
E3.2	Maintain a clean and safe work environment
E3.3	Demonstrate a positive personal attitude towards safety
E3.4	Comply with established safety practices
E3.5	Identify fire exits and fire-fighting equipment
E3.6	Report unsafe practices to appropriate personnel
	OCCUPATIONAL
O3.1	Complete forms and paperwork as required
O3.2	Wear protective safety clothing as required
O3.3	Maintain and use protective guards and equipment on machinery
O3.4	Handle and store flammable materials appropriately
O3.5	Use electrical devices correctly and safely
O3.6	Prevent spontaneous ignition by practicing proper waste disposal habits
O3.7	Keep marked aisles clear of equipment and materials

O3.8	Interpret and display MSDS sheets as required
O3.9	Operate equipment in a safe, prescribed manner
O3.10	Follow established safety procedures when around machinery or equipment
O3.11	Follow established safety procedures when using tools or operating machinery
O3.12	Operate hand tools in a safe, prescribed manner
O3.13	Locate power shutoff controls for all machinery and equipment
O3.14	Identify and report malfunctions to appropriate personnel
O3.15	Inspect material, equipment and fixtures for defects
O3.16	Determine weight and operating limits of equipment
O3.17	Perform periodic checks during operation to assure proper function
O3.18	Respond to emergencies in the appropriate manner
O3.19	Describe ergonomics and its importance to the manufacturing process
	PROBLEM SOLVING
	EMPLOYABILITY
E4.1	Explain the value of applying a problem-solving system
E4.2	Apply a system of problem solving
E4.3	Identify opportunities for applying problem solving techniques
	QUALITY ASSURANCE
	EMPLOYABILITY
E5.1	Explain the effect of quality on profit
E5.2	Identify the effects of continuous quality improvement
E5.3	Identify your customers
	OCCUPATIONAL
O5.1	Identify customer problems
O5.2	Determine causes of the problem
O5.3	Apply problem-solving system
O5.4	Recommend possible solutions
O5.5	Define SPC
O5.6	Define international quality standards and systems such as ISO/QS 9000
	BLUEPRINT READING
	OCCUPATIONAL
O6.1	Define basic blueprint terminology
O6.2	Interpret commonly used abbreviations and terminology
O6.3	Identify types of lines within a drawing
	BUSINESS PLANNING & OPERATION
	ACADEMIC
A7.1	Identify the organizational need for profit
A7.2	Define the term "profit"
	EMPLOYABILITY
E7.1	Identify the components that lead to customer satisfaction
E7.2	Identify possible actions that may lead to customer dissatisfaction
E7.3	Identify the ways that the level of customer satisfaction may affect company success
E7.4	Explain the importance of a business reputation
E7.5	Identify the ways that customer satisfaction influences a business reputation
	WORKFORCE ISSUES
	EMPLOYABILITY
E8.1	Recognize the difference between a team environment workplace and a conventional workplace
E8.2	Identify the characteristics of a diverse work force
E8.3	Identify good ethical characteristics and behaviors
E8.4	Demonstrate good ethical characteristics and behaviors
E8.5	Differentiate between good and poor business ethics practices

E8.6	Match employee responsibilities to employer expectations
E8.7	Define discrimination, harassment and equity
E8.8	Demonstrate non-discriminatory behavior
E8.9	Maintain confidentiality and sensitivity of company information
	WORKPLACE SKILLS
	EMPLOYABILITY
E9.1	Demonstrate consistently punctual arrival
E9.2	Document regular attendance
E9.3	Demonstrate enthusiasm and confidence about work and learning new tasks
E9.4	Demonstrate appropriate dress and hygiene for successful employment
E9.5	Demonstrate the ability to act in a polite and respectful way towards co-workers
E9.6	Demonstrate the ability to complete tasks on time and accurately
E9.7	Demonstrate the ability to make career decisions
E9.8	Prepare a resume and letter of application or interest
E9.9	Fill out an application for employment
E9.10	Participate in an employment interview
E9.11	Follow directions and procedures
E9.12	Be truthful in all communications with co-workers and supervisors
E9.13	Accept constructive criticism
E9.14	Demonstrate an ability to learn new skills and behaviors
E9.15	Demonstrate a willingness to work
E9.16	Demonstrate a willingness to learn
E9.17	Work with minimal supervision
E9.18	Plan and organize
	OCCUPATIONAL
O9.1	Demonstrate safe, careful use, treatment and maintenance of tools, equipment, and machines
O9.2	Demonstrate basic mechanical skills
	LEARNING SKILLS
	ACADEMIC
A10.1	Identify personal preferred learning styles
A10.2	Demonstrate ability to learn new process steps
A10.3	Implement new process steps given oral instructions
A10.4	Read process instructions and implement appropriate steps
	OCCUPATIONAL
O10.1	Participate in product or process specific training and report significant information

Basic Manufacturing Crosswalk of Skill Standards to Academic Expectations and SCANS

Skill Standards		Kentucky Academic Expectations		SCANS	
	COMMUNICATIONS & TEAMWORK				
	ACADEMIC				
A1.1	Read process information and follow instructions.	1.2	Reading	C5 C6 C7 F1	Acquires and Evaluates Information Organizes and Maintains Information Interprets and Communicates Information Reading
A1.2	Read material and describe concepts	1.2 1.10 3.4 3.7	Reading Classifying Resourceful and Creative Learn on One's Own	C7 F1 F2 F6 F11	Interprets and Communicates Information Reading Writing Speaking Knows How to Learn
A1.3	Use correct pronunciation	1.4 1.12	Listening Speaking	C7 F5 F6	Interprets and Communicates Information Listening Speaking
A1.4	Use correct spelling	1.11	Writing	C7 F2	Interprets and Communicates Information Writing
A1.5	Write with accuracy, brevity, and clarity	1.11	Writing	C7 F2	Interprets and Communicates Information Writing
A1.6	Keyboarding	1.16	Using Electronic Technology	C8 F1	Uses Computers to Process Information Reading
A1.7	Knowledge of conflict and resolution techniques	2.31 2.32 4.1 4.2 4.3 4.4 4.5 4.6	Physical Wellness Mental and Emotional Wellness Interpersonal Skills Productive Team Skills Consistent, Responsive, Caring Behavior Rights and Responsibilities Multicultural Sensitivity Open Mind to alternative Perspectives	F1 F5 F11	Reading Listening Knows How to Learn
A1.8	Possess basic computer keyboarding skills	1.16	Using Electronic Technology	C8 F1	Uses Computers to Process Information Reading

Basic Manufacturing Crosswalk of Skill Standards to Academic Expectations and SCANS

Skill Standards		Kentucky Academic Expectations		SCANS	
A1.9	Understand basics of interpersonal communication (listening, written/oral, etc.)	1.2 1.3 1.4 1.11 1.12	Reading Observing Listening Writing Speaking	C7 F1 F2 F5 F6	Interprets and Communicates Information Reading Writing Listening Speaking
EMPLOYABILITY					
E1.1	Read documentation, such as computer manual, to determine actions for specific situations	1.2 1.10 3.7 5.4	Reading Classifying Learn On One's Own Decision Making	C5 C7 F1 F8 F12	Listening Interprets and Communicates Information Reading Decision Making Reasoning
E1.2	Organize materials with logical flow	3.4 3.7 5.1 5.2 5.3 5.4 5.5	Resourceful and Creative Learn On One's Own Critical Thinking Creative Thinking Conceptualizing Decision Making Problem Solving	C5 F1 F2 F5 F6 F8	Acquires and Evaluates Information Reading Writing Listening Speaking Decision Making
E1.3	Interpret and clarify directions prepared by others	1.2 1.4 1.12 5.1	Reading Listening Speaking Critical Thinking	C5 F1 F2 F5 F6 F8 F9 F12 F13	Acquires and Evaluates Information Reading Writing Listening Speaking Decision Making Problem Solving Reasoning Responsibility

Basic Manufacturing Crosswalk of Skill Standards to Academic Expectations and SCANS

Skill Standards		Kentucky Academic Expectations		SCANS	
E1.4	Communicate with customer to establish requirements	1.4 1.12 3.3 4.1 4.3 4.6 5.1 5.4 5.5	Listening Speaking Adaptable and Flexible Interpersonal Skills Consistent, Responsive, Caring Behavior Open Mind to Alternative Perspectives Critical Thinking Decision Making Problem Solving	C5 F5 F6 F8 F9 F12	Acquires and Evaluates Information Listening Speaking Decision Making Problem Solving Reasoning
E1.5	Understand team concepts	1.4 1.12 2.26 3.3 4.1 4.2	Listening Speaking Diversity Adaptable and Flexible Interpersonal Skills Productive Team Skills	C4 F5 F6 F15 F17	Allocates Human Resources Listening Speaking Social Integrity/Honesty
E1.6	Write steps of an occupational process using sentences and statements as appropriate	1.11 5.1 5.3 5.4 5.5	Writing Critical Thinking Conceptualizing Decision Making Problem Solving	F2 F12	Writing Reasoning
MATH AND MEASUREMENT					
ACADEMIC					
A2.1	Add, subtract, multiply, and divide four-digit numbers with the use of a calculator	2.7 2.8	Number Mathematical Procedures	F3	Arithmetic
A2.2	Add, subtract, multiply, and divide four-digit numbers without the use of a calculator	2.7 2.8	Number Mathematical Procedures	F3	Arithmetic
A2.3	Apply basic math functions to solve problems	2.7 2.8 2.9 2.10 5.5	Number Mathematical Procedures Space and Dimensionality Measurement Problem Solving	F3 F4 F9	Arithmetic Mathematics Problem Solving
A2.4	Convert between US and metric measurement systems	2.7 2.8 2.10 5.1	Number Mathematical Procedures Measurement Critical Thinking	F3 F4 F9	Arithmetic Mathematics Problem Solving
A2.5	Convert fractional measurement to decimal measurement	2.7 2.8 5.1	Number Mathematical Procedures Critical Thinking	F3 F4 F9	Arithmetic Mathematics Problem Solving

Basic Manufacturing Crosswalk of Skill Standards to Academic Expectations and SCANS

Skill Standards		Kentucky Academic Expectations		SCANS	
A2.6	Compute within measurement systems	1.6 1.8 1.9 5.1 5.4 5.5	Computing Measuring Mathematical Reasoning Critical Thinking Decision Making Problem Solving	F3 F4 F9	Arithmetic Mathematics Problem Solving
A2.7	Document results of measurement activities and calculations	1.6 1.8 1.9 5.1 5.4 5.5	Computing Measuring Mathematical Reasoning Critical Thinking Decision Making Problem Solving	F2 F3 F4 F9	Writing Arithmetic Mathematics Problem Solving
A2.8	Distinguish between US and metric measuring systems	2.7 2.8 2.9 5.1	Number Mathematical Procedures Space and Dimensionality Critical Thinking	F3 F4 F12	Arithmetic Mathematics Reasoning
A2.9	Calculate with percents, rate, ratio, and proportion with the use of a calculator	1.9 5.5	Mathematical Reasoning Problem Solving	C18 C19 F3 F4 F9	Selects Technology Applies Technology to a Task Arithmetic Mathematics Problem Solving
A2.10	Make reasonable estimates of arithmetic results without the use of a calculator	1.9 5.5	Mathematical Reasoning Problem Solving	F3 F4 F9	Arithmetic Mathematics Problem Solving
A2.11	Use hand calculators	2.7 2.8 5.5	Number Mathematical Procedures Problem Solving	F3 F4 F9	Arithmetic Mathematics Problem Solving
OCCUPATIONAL					
O2.1	Create and interpret basic graphs and charts commonly used in manufacturing	2.8 2.9 2.13 5.4 5.5	Mathematical Procedures Space and Dimensionality Data Decision Making Problem Solving	C6 F8 F9 F12	Organizes and Maintains Information Decision Making Problem Solving Reasoning
O2.2	Match measurement activities to manufacturing processes	1.8 1.9 2.9 2.10	Measuring Mathematical Reasoning Space and dimensionality Measurement	F3 F4	Arithmetic Mathematics
O2.3	Select and use appropriate measurement techniques and instruments	1.8 1.9 2.9 2.10 5.5	Measuring Mathematical Reasoning Space and dimensionality Measurement Problem Solving	C18 C19	Selects Technology Applies Technology to a Task

Basic Manufacturing Crosswalk of Skill Standards to Academic Expectations and SCANS

Skill Standards		Kentucky Academic Expectations		SCANS	
O2.4	Demonstrate proper general measurement techniques	1.8 1.9 2.9 2.10	Measuring Mathematical Reasoning Space and dimensionality Measurement	F3 F4 F12	Arithmetic Mathematics Reasoning
WORKPLACE SAFETY & HEALTH					
EMPLOYABILITY					
E3.1	Assume responsibility for the personal safety of self and others	2.31 2.33 3.2 4.3 4.4 5.4 5.5	Physical Wellness Community Health System Healthy Lifestyles Consistent, Responsive, Caring Behavior Rights and Responsibilities Decision Making Problem solving	F12 F13 F16 F17	Reasoning Responsibility Self-Management Integrity/Honesty
E3.2	Maintain a clean and safe work environment	4.4 5.4	Rights and Responsibilities Decision Making	F8 F12 F13	Decision Making Reasoning Responsibility
E3.3	Demonstrate a positive personal attitude towards safety	4.4 5.4	Rights and Responsibilities Decision Making	F8 F12 F13 F16	Decision Making Reasoning Responsibility Self-Management
E3.4	Comply with established safety practices	4.4 5.4 5.5	Rights and Responsibilities Decision Making Problem Solving	F8 F9 F12 F13 F16 F17	Decision making Problem Solving Reasoning Responsibility Self-Management Integrity/Honesty
E3.5	Identify fire exits and fire-fighting equipment				
E3.6	Report unsafe practices to appropriate personnel	1.3 1.11 1.12 2.31 4.4	Observing Writing Speaking Physical Wellness Rights and Responsibilities	F2 F6 F13 F17	Writing Speaking Responsibility Integrity/Honesty
OCCUPATIONAL					
O3.1	Complete forms and paperwork as required	1.2 1.11 2.37 5.4	Reading Writing Employability Skills Decision Making	C1 C6 F1 F2 F8 F13 F16	Allocates Time Organizes and Maintains Information Reading Writing Decision Making Responsibility Self-Management

Basic Manufacturing Crosswalk of Skill Standards to Academic Expectations and SCANS

Skill Standards		Kentucky Academic Expectations		SCANS	
O3.2	Wear protective safety clothing as required	2.31 4.4 5.4	Physical Wellness Rights and Responsibilities Decision Making	F8 F13 F16 F17	Decision Making Responsibility Self-Management Integrity/Honesty
O3.3	Maintain and use protective guards and equipment on machinery	2.31 4.4 5.4	Physical Wellness Rights and Responsibilities Decision Making	F8 F13 F16 F17	Decision Making Responsibility Self-Management Integrity/Honesty
O3.4	Handle and store flammable materials appropriately	2.31 4.4 5.4	Physical Wellness Rights and Responsibilities Decision Making	F8 F13 F16 F17	Decision Making Responsibility Self-Management Integrity/Honesty
O3.5	Use electrical devices correctly and safely	2.31 4.4 5.4	Physical Wellness Rights and Responsibilities Decision Making	F8 F13 F16 F17	Decision Making Responsibility Self-Management Integrity/Honesty
O3.6	Prevent spontaneous ignition by practicing proper waste disposal habits	2.31 4.4 5.4	Physical Wellness Rights and Responsibilities Decision Making	F8 F13 F16 F17	Decision Making Responsibility Self-Management Integrity/Honesty
O3.7	Keep marked aisles clear of equipment and materials	2.31 4.4 5.4	Physical Wellness Rights and Responsibilities Decision Making	F8 F13 F16 F17	Decision Making Responsibility Self-Management Integrity/Honesty
O3.8	Interpret and display MSDS sheets as required	1.2 2.31 4.4 5.4	Reading Physical Wellness Rights and Responsibilities Decision Making	F1 F8 F13 F16 F17	Reading Decision Making Responsibility Self-Management Integrity/Honesty
O3.9	Operate equipment in a safe, prescribed manner	2.31 2.34 4.4 5.4	Physical Wellness Psychomotor Skills Rights and Responsibilities Decision Making	F8 F12 F13 F16 F17	Decision Making Reasoning Responsibility Self-Management Integrity/Honesty

Basic Manufacturing Crosswalk of Skill Standards to Academic Expectations and SCANS

Skill Standards		Kentucky Academic Expectations		SCANS	
O3.10	Follow established safety procedures when around machinery or equipment	2.31 3.5 4.3 4.4 5.4	Physical Wellness Self-Control and Self-Discipline Consistent, Responsive, Caring Behavior Rights and Responsibilities Decision Making	C7 C9 C16 C20 F1 F5 F8 F12 F13 F16 F17	Interprets and Communicates Information Participates Monitors and Corrects Performance Maintains and Troubleshoots Technology Reading Listening Decision Making Reasoning Responsibility Self-Management Integrity/Honesty
O3.11	Follow established safety procedures when using tools or operating machinery	2.31 3.5 4.3 4.4 5.4	Physical Wellness Self-Control and Self-Discipline Consistent, Responsive, Caring Behavior Rights and Responsibilities Decision Making	C7 C9 C16 C20 F1 F5 F8 F12 F13 F16 F17	Interprets and Communicates Information Participates Monitors and Corrects Performance Maintains and Troubleshoots Technology Reading Listening Decision Making Reasoning Responsibility Self-Management Integrity/Honesty
O3.12	Operate hand tools in a safe, prescribed manner	2.31 3.5 4.3 4.4 5.4	Physical Wellness Self-Control and Self-Discipline Consistent, Responsive, Caring Behavior Rights and Responsibilities Decision Making	C7 C9 C16 C20 F1 F5 F8 F12 F13 F16 F17	Interprets and Communicates Information Participates Monitors and Corrects Performance Maintains and Troubleshoots Technology Reading Listening Decision Making Reasoning Responsibility Self-Management Integrity/Honesty
O3.13	Locate power shutoff controls for all machinery and equipment	2.34 3.4 3.5 5.4	Psychomotor Skills Resourceful and Creative Self-Control and Self-Discipline Decision Making	C5 F1 F8 F12 F13 F16	Acquires and Evaluates Information Reading Decision Making Reasoning Responsibility Self-Management

Basic Manufacturing Crosswalk of Skill Standards to Academic Expectations and SCANS

Skill Standards		Kentucky Academic Expectations		SCANS	
O3.14	Identify and report malfunctions to appropriate personnel	1.3 1.11 1.12 2.31 4.4 5.4	Observing Writing Speaking Physical Wellness Rights and Responsibilities Decision Making	C5 F2 F6 F8 F12 F13 F17	Acquires and Evaluates Information Writing Speaking Decision Making Reasoning Responsibility Integrity/Honesty
O3.15	Inspect material, equipment and fixtures for defects	1.3 4.4 5.4	Observing Rights and Responsibilities Decision Making	F8 F12 F13	Decision Making Reasoning Responsibility
O3.16	Determine weight and operating limits of equipment	1.2 1.3 1.10	Reading Observing Classifying	F13 F16 F17	Responsibility Self-Management Integrity/Honesty
O3.17	Perform periodic checks during operation to assure proper function	1.3 4.4 5.4	Observing Rights and Responsibilities Decision Making	C15 F8 F12 F13 F16 F17	Understands Systems Decision Making Reasoning Responsibility Self-Management Integrity/Honesty
O3.18	Respond to emergencies in the appropriate manner	1.4 1.12 3.1 3.3 3.4 4.3 4.5 5.1 5.4 5.5 6.1	Listening Speaking Positive Growth in Self-Concept Task/Project Adaptable and Flexible Resourceful and Creative Consistent, Responsive, Caring Behavior Multicultural Sensitivity Critical Thinking Decision Making Problem Solving Applying Multiple Perspectives	C4 F5 F6 F8 F9 F12 F13 F16	Allocates Human Resources Listening Speaking Decision Making Problem Solving Reasoning Responsibility Self-Management
O3.19	Describe ergonomics and its importance to the manufacturing process	1.11 1.12 2.31 3.2	Writing Speaking Physical Wellness Healthy Lifestyle	F2 F6	Writing Speaking
PROBLEM SOLVING					
EMPLOYABILITY					
E4.1	Explain the value of applying a problem-solving system	1.12 4.4 5.5	Speaking Rights and Responsibilities Problem Solving	F6 F9 F12 F17	Speaking Problem Solving Reasoning Integrity/Honesty

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Skill Standards		Kentucky Academic Expectations		SCANS	
E4.2	Apply a system of problem solving	4.4 5.4 5.5 6.1	Rights and Responsibilities Decision Making Problem Solving Applying Multiple Perspectives	F8 F9 F12 F13 F17	Decision Making Problem Solving Reasoning Responsibility Integrity/Honesty
E4.3	Identify opportunities for applying problem-solving techniques	1.3 4.4 5.4 5.5 6.1	Observing Rights and Responsibilities Decision Making Problem Solving Applying Multiple Perspectives	F8 F9 F12 F13	Decision Making Problem Solving Reasoning Responsibility
QUALITY ASSURANCE					
EMPLOYABILITY					
E5.1	Explain the effect of quality on profit	1.11 1.12	Writing Speaking	F2 F6	Writing Speaking
E5.2	Identify the effects of continuous quality improvement	1.3 1.10 4.4 4.6 5.1 5.4	Observing Classifying Rights and Responsibilities Open Mind to Alternative Perspectives Critical Thinking Decision Making	F8 F10 F12	Decision Making Seeing Things in the Mind's Eye Reasoning
E5.3	Identify your customers	1.3 1.4 1.12	Observing Listening Speaking	F5 F6 F8 F15	Listening Speaking Decision Making Social
OCCUPATIONAL					
O5.1	Identify customer problems	1.3 1.4 1.12	Observing Listening Speaking	F5 F6 F8 F13 F15 F17	Listening Speaking Decision Making Responsibility Social Integrity/Honesty
O5.2	Determine causes of the problem	1.3 1.4 1.12 4.4 5.1 5.4 5.5	Observing Listening Speaking Rights and Responsibilities Critical Thinking Decision Making Problem Solving	C5 F5 F6 F8 F9 F12	Acquires and Evaluates Information Listening Speaking Decision Making Problem Solving Reasoning

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Skill Standards		Kentucky Academic Expectations		SCANS	
O5.3	Apply problem-solving system	1.4 1.12 3.3 4.4 5.4 5.5	Listening Speaking Adaptable and Flexible Rights and Responsibilities Decision Making Problem Solving	C12 F5 F6 F8 F9 F12 F13	Exercises Leadership Listening Speaking Decision Making Problem Solving Reasoning Responsibility
O5.4	Recommend possible solutions	1.11 1.12 4.3 4.4 4.6 5.5	Writing Speaking Consistent, Responsive, Caring Behavior Rights and Responsibilities Open Mind to Alternative Perspectives Problem Solving	C5 F1 F2 F5 F6 F8 F9 F12	Acquires and Evaluates Information Reading Writing Listening Speaking Decision Making Problem Solving Reasoning
O5.5	Define SPC	1,2 1,11	Reading Writing	C7 F2 F6	Interprets and Communicates Information Writing Speaking
O5.6	Define international quality standards and systems such as ISO/QS 9000	1.2 1.11	Reading Writing	C7 F2 F6	Interprets and Communicates Information Writing Speaking
	BLUEPRINT READING				
	OCCUPATIONAL				
O6.1	Define basic blueprint terminology	1.2 1.11	Reading Writing	C7 F2 F6	Interprets and Communicates Information Writing Speaking
O6.2	Interpret commonly used abbreviations and terminology	1.3 1.10 5.1 5.4 5.5	Observing Classifying Critical Thinking Decision Making Problem Solving	C5 F8 F12	Acquires and Evaluates Information Decision Making Reasoning
O6.3	Identify types of lines within a drawing	1.3 1.10 5.1 5.4 5.5	Observing Classifying Critical Thinking Decision Making Problem Solving	C5 F8 F12	Acquires and Evaluates Information Decision Making Reasoning
	BUSINESS PLANNING & OPERATION				
	ACADEMIC				

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Skill Standards		Kentucky Academic Expectations		SCANS	
A7.1	Identify the organizational need for profit	2.18 5.1	Structure and Function of Economic System Critical Thinking	C5 F2 F6 F12	Acquires and Evaluates Information Writing Speaking Reasoning
A7.2	Define the term "profit"	2.18	Structure and Function of Economic System	C7 F2 F6	Interprets and Communicates Information Writing Speaking
EMPLOYABILITY					
E7.1	Identify the components that lead to customer satisfaction	1.2 1.3 1.4 4.1 5.4 6.1	Reading Observing Listening Interpersonal Skills Decision Making Applying Multiple Perspectives	C7 C11 F5 F6 F9 F13 F15 F16	Interprets and Communicates Information Serves Clients/Customers Listening Speaking Problem Solving Responsibility Social Self-Management
E7.2	Identify possible actions that may lead to customer dissatisfaction	1.2 1.3 1.4 4.1 5.4 6.1	Reading Observing Listening Interpersonal Skills Decision Making Applying Multiple Perspectives	C7 C11 F5 F6 F9 F13 F16	Interprets and Communicates Information Serves Clients/Customers Listening Speaking Problem Solving Responsibility Self-Management
E7.3	Identify the ways that the level of customer satisfaction may affect company success	1.2 1.3 1.4 4.1 5.1 6.2	Reading Observing Listening Interpersonal Skills Critical Thinking Developing New Knowledge	C7 C11 F9	Interprets and Communicates Information Serves Clients/Customers Problem Solving
E7.4	Explain the importance of a business reputation	1.11 1.12	Writing Speaking	C7 C11	Interprets and Communicates Information Serves Clients/Customers
E7.5	Identify the ways that customer satisfaction influences a business reputation	1.2 1.3 1.4 4.1 5.4 6.1	Reading Observing Listening Interpersonal Skills Decision Making Applying Multiple Perspectives	C7 C11	Interprets and Communicates Information Serves Clients/Customers
WORKFORCE ISSUES					
EMPLOYABILITY					

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Skill Standards		Kentucky Academic Expectations		SCANS	
E8.1	Recognize the difference between a team environment workplace and a conventional workplace	1.2 1.3 1.4 4.1 4.2 4.5	Reading Observing Listening Interpersonal Skills Productive Team Skills Multicultural Sensitivity	C7 C9 C15	Interprets and Communicates Information Participates Understands Systems
E8.2	Identify the characteristics of a diverse work force	2.17 2.26 4.5 4.6 5.3	Cultural Diversity Diversity Multicultural Sensitivity Open Mind to Alternative Perspectives Conceptualizing	C5 C7 C9 C13 F13 F15 F16 F17	Acquires and Evaluates Information Interprets and Communicates Information Participates Understands Systems Responsibility Social Self-Management Integrity/Honesty
E8.3	Identify good ethical characteristics and behaviors	2.29 2.32 3.6 5.4	Family Life and Parenting Mental and Emotional Wellness Ethical Values Decision Making	C5 C7 C9 F13 F15 F17	Acquires and Evaluates Information Interprets and Communicates Information Participates Responsibility Social Integrity/Honesty
E8.4	Demonstrate good ethical characteristics and behaviors	3.6 5.2	Ethical Values Creative Thinking	C5 F13 F15 F17	Acquires and Evaluates Information Responsibility Social Integrity/Honesty
E8.5	Differentiate between good and poor business ethics practices	3.6 5.2	Ethical Values Creative Thinking	C5 F13 F15 F17	Acquires and Evaluates Information Responsibility Social Integrity/Honesty
E8.6	Match employee responsibilities to employer expectations	3.3 4.1 4.4	Adaptable and Flexible Interpersonal Skills Rights and Responsibilities	C6 C7 C11 C16 F5 F6 F11 F12 F13 F16	Organizes and Maintains Information Interprets and Communicates Information Serves Clients/Customers Monitors and Corrects Performance Listening Speaking Knows How to Learn Reasoning Responsibility Self-Management

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Skill Standards		Kentucky Academic Expectations		SCANS	
E8.7	Define discrimination, harassment and equity	1.1 1.2 1.3 1.4 1.11 1.12	Accessing Sources of Information Reading Observing Listening Writing Speaking	C7 C14 F1 F5 F6 F16 F17	Interprets and Communicates Information Works with Cultural Diversity Reading Listening Speaking Self-Management Integrity/Honesty
E8.8	Demonstrate non-discriminatory behavior	3.5	Self-Control and Self-Discipline	C9 C10 C13 F13 F15 F16 F17	Participates Teaches Others Negotiates to Arrive at a Decision Responsibility Social Self-Management Integrity/Honesty
E8.9	Maintain confidentiality and sensitivity of company information	3.6 5.4	Ethical Values Decision Making	C5 C6 C11 C12 F13 F16 F17	Acquires and Evaluates Information Organizes and Maintains Information Serves Clients/Customers Exercises Leadership Responsibility Self-Management Integrity/Honesty
WORKPLACE SKILLS					
EMPLOYABILITY					
E9.1	Demonstrate consistently punctual arrival	3.5 4.4	Self-Control and Self-Discipline Rights and Responsibilities	F13 F16 F17	Responsibility Self-Management Integrity/Honesty
E9.2	Document regular attendance	1.11	Writing	C6 F13 F16 F17	Organizes and Maintains Information Responsibility Self-Management Integrity/Honesty
E9.3	Demonstrate enthusiasm and confidence about work and learning new tasks	2.37 3.3 3.7 4.4	Employability Skills Adaptable and Flexible Learn On One's Own Rights and Responsibilities	C9 C12 F5 F6 F11 F15 F16	Participates Exercises Leadership Listening Speaking Knows How to Learn Social Self-Management
E9.4	Demonstrate appropriate dress and hygiene for successful employment	3.5 4.4	Self-Control and Self-Discipline Rights and Responsibilities	C6 F1 F5 F16	Organizes and Maintains Information Reading Listening Self-Management

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Skill Standards		Kentucky Academic Expectations		SCANS	
E9.5	Demonstrate the ability to act in a polite and respectful way towards co-workers	4.1 4.2 4.3 4.4 4.5 4.6	Interpersonal Skills Productive Team Skills Consistent, Responsive, Caring Behavior Rights and Responsibilities Multicultural Sensitivity Open Mind to Alternative Perspectives	F5 F6 F16	Listening Speaking Self-Management
E9.6	Demonstrate the ability to complete tasks on time and accurately	2.37 3.5 4.4	Employability Skills Self-Control and Self-Discipline Rights and Responsibilities	C6 C9 C11 C16 F13 F16 F17	Organizes and Maintains Information Participates Serves Clients/Customers Monitors and Corrects Performance Responsibility Self-Management Integrity/Honesty
E9.7	Demonstrate the ability to make career decisions	2.36 5.4	Career Path Decision Making	C5 F8 F11 F13 F14 F16	Acquires and Evaluates Information Decision Making Knows How to Learn Responsibility Self-Esteem Self-Management
E9.8	Prepare a resume and letter of application or interest	2.38	Post-Secondary Opportunity Search	C8 C19 F1 F2 F11	Uses Computers to Process Information Applies Technology to a Task Reading Writing Knows How to Learn
E9.9	Fill out an application for employment	2.38	Post-Secondary Opportunity Search	C8 C19 F1 F2 F11	Uses Computers to Process Information Applies Technology to a Task Reading Writing Knows How to Learn
E9.10	Participate in an employment interview	2.38	Post-Secondary Opportunity Search	C8 C19 F1 F2 F11	Uses Computers to Process Information Applies Technology to a Task Reading Writing Knows How to Learn
E9.11	Follow directions and procedures	4.4 5.4	Rights and Responsibilities Decision Making	C7 C14 F5 F6 F11 F12 F15 F16 F17	Interprets and Communicates Information Works with Cultural Diversity Listening Speaking Knows How to Learn Reasoning Social Self-Management Integrity/Honesty

Basic Manufacturing Crosswalk of Skill Standards to Academic Expectations and SCANS

Skill Standards		Kentucky Academic Expectations		SCANS	
E9.12	Be truthful in all communications with co-workers and supervisors	3.6 4.3 4.4	Ethical Values Consistent, Responsive, Caring Behavior Rights and Responsibilities	C5 C6 C9 F2 F6 F13 F16 F17	Acquires and Evaluates Information Organizes and Maintains Information Participates Writing Speaking Responsibility Self-Management Integrity/Honesty
E9.13	Accept constructive criticism	3.1 4.6	Positive Growth in Self-Concept Task/Project Open Mind to Alternative Perspectives	C7 C9 C12 C16 F5 F6 F11 F13 F14 F16	Interprets and Communicates Information Participates Exercises Leadership Monitors and Corrects Performance Listening Speaking Knows How to Learn Responsibility Self-Esteem Self-Management
E9.14	Demonstrate an ability to learn new skills and behaviors	2.37 3.1 3.7 5.4	Employability Skills Positive Growth in Self-Concept Task/Project Learn on One's Own Decision Making	C5 C6 C7 F11 F16	Acquires and Evaluates Information Organizes and Maintains Information Interprets and Communicates Information Knows How to Learn Self-Management
E9.15	Demonstrate a willingness to work	4.2	Productive Team Skills	C9 F9 F13 F16 F17	Participates Problem Solving Responsibility Self-Management Integrity/Honesty
E9.16	Demonstrate a willingness to learn	3.7 5.5	Learn on One's Own Problem Solving	C5 F11	Acquires and Evaluates Information Knows How to Learn
E9.17	Work with minimal supervision	2.37 3.4 3.7	Employability Skills Resourceful and Creative Learn on One's Own	F13 F16	Responsibility Self-Management
E9.18	Plan and organize	1.1 5.1	Accessing Sources of Information Critical Thinking	C1 C3 C4 C5 C7 C15 F8 F9 F13 F16	Allocates Time Allocates Materials and Facility Resources Allocates Human Resources Acquires and Evaluates Information Interprets and Communicates Information Understands Systems Decision Making Problem Solving Responsibility Self-Management

Basic Manufacturing Crosswalk of Skill Standards to Academic Expectations and SCANS

Skill Standards		Kentucky Academic Expectations		SCANS	
	OCCUPATIONAL				
O9.1	Demonstrate safe, careful use, treatment and maintenance of tools, equipment, and machines	1.16 2.31 2.37 3.5 4.3 4.4 5.4	Using Electronic Technology Physical Wellness Employability Skills Self-Control and Self-Discipline Consistent, Responsive, Caring Behavior Rights and Responsibilities Decision Making	C6 C20 F1 F5 F9 F13 F16	Organizes and Maintains Information Maintains and Troubleshoots Technology Reading Listening Problem Solving Responsibility Self-Management
O9.2	Demonstrate basic mechanical skills	2.34 5.5	Psychomotor Skills Problem Solving	C15 C18 C19 F8 F9 F11 F12 F13	Understands Systems Selects Technology Applies Technology to a Task Decision Making Problem Solving Knows How to Learn Reasoning Responsibility
	LEARNING SKILLS				
	ACADEMIC				
A10.1	Identify personal preferred learning styles	3.1 5.4	Positive Growth in Self-Concept Task/Project Decision Making	C5 F1 F5 F11 F14 F16	Acquires and Evaluates Information Reading Listening Knows How to Learn Self-Esteem Self-Management
A10.2	Demonstrate ability to learn new process steps	3.1 3.3 3.7 5.1 5.3	Positive Growth in Self-Concept Task/Project Adaptable and Flexible Learn On One's Own Critical Thinking Conceptualizing	C6 C15 F1 F5 F9 F12	Organizes and Maintains Information Understands Systems Reading Listening Problem Solving Reasoning
A10.3	Implement new process steps given oral instructions	1.4 5.4	Listening Decision Making	C5 F5 F9	Acquires and Evaluates Information Listening Problem Solving
A10.4	Read process instructions and implement appropriate steps	1.2 5.4	Reading Decision Making	C5 F1 F9	Acquires and Evaluates Information Reading Problem Solving
	OCCUPATIONAL				

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Skill Standards		Kentucky Academic Expectations		SCANS	
O10.1	Participate in product or process specific training and report significant information	1.3	Observing	C1	Allocates Time
		1.4	Listening	C7	Interprets and Communicates Information
		2.22	Convey a Point of View	C9	Participates
		4.4	Rights and Responsibilities	C10	Teaches Others
		5.4	Decision Making	F5	Listening
		6.2	Developing New Knowledge	F6	Speaking
		6.3	Expanding Existing Knowledge	F13	Responsibility